

**A New Species of the Genus *Ceradocus*  
(Crustacea, Amphipoda, Melitidae) from Korea**

**Kim, Chang Bae and Kim, Won**

(Department of Zoology, College of Natural Sciences, Seoul National University, Seoul 151-742, Republic of Korea)

한국해산 *Ceradocus* 속 (Melitidae 과) 옆새우류의 1신종

김 창 배 · 김 원  
(서울대학교 자연과학대학 동물학과)

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적 요

미포에서 채집된 옆새우류 1종을 *Ceradocus*(*Denticeradocus*) *koreanus*라고 명명하고 기재한다.

Key words: Crustacea, Amphipoda, Melitidae, *Ceradocus*, Korea.

Continuous studies of the Korean gammaridean amphipod fauna (Kim and Kim, 1987, 1988) have revealed a previously unknown species of the genus *Ceradocus*. More than 30 species of the genus *Ceradocus* have been reported in the world. The species of this genus distributed all over the world. But, there was no record of the members of this genus in Korea. The present new species is first recorded in the genus *Ceradocus* from Korea.

Family Melitidae Bousfield, 1973

Genus *Ceradocus* Costa, 1853

***Ceradocus* (*Denticeradocus*) *koreanus*, new species**

(Figs. 1-5)

**Material examined:** Holotype- adult male (SAH 00006), Mip'o, Pusan, body length: 21.3 mm, obtained from fishing net which contained rocks encrusted with algae, bryozoans and hydrozoans, depth is unknown, June 8, 1981 (collector: Dr. H. S. Kim). Paratypes- 3 adult males (SAP 00020), collection details as the holotype. All type specimens are deposited in the Department of Zoology, Seoul National University.

**Description of holotype male:** Head (Figs. 1;3C) as long as pereonites 1, 2 combined. Rostrum small.

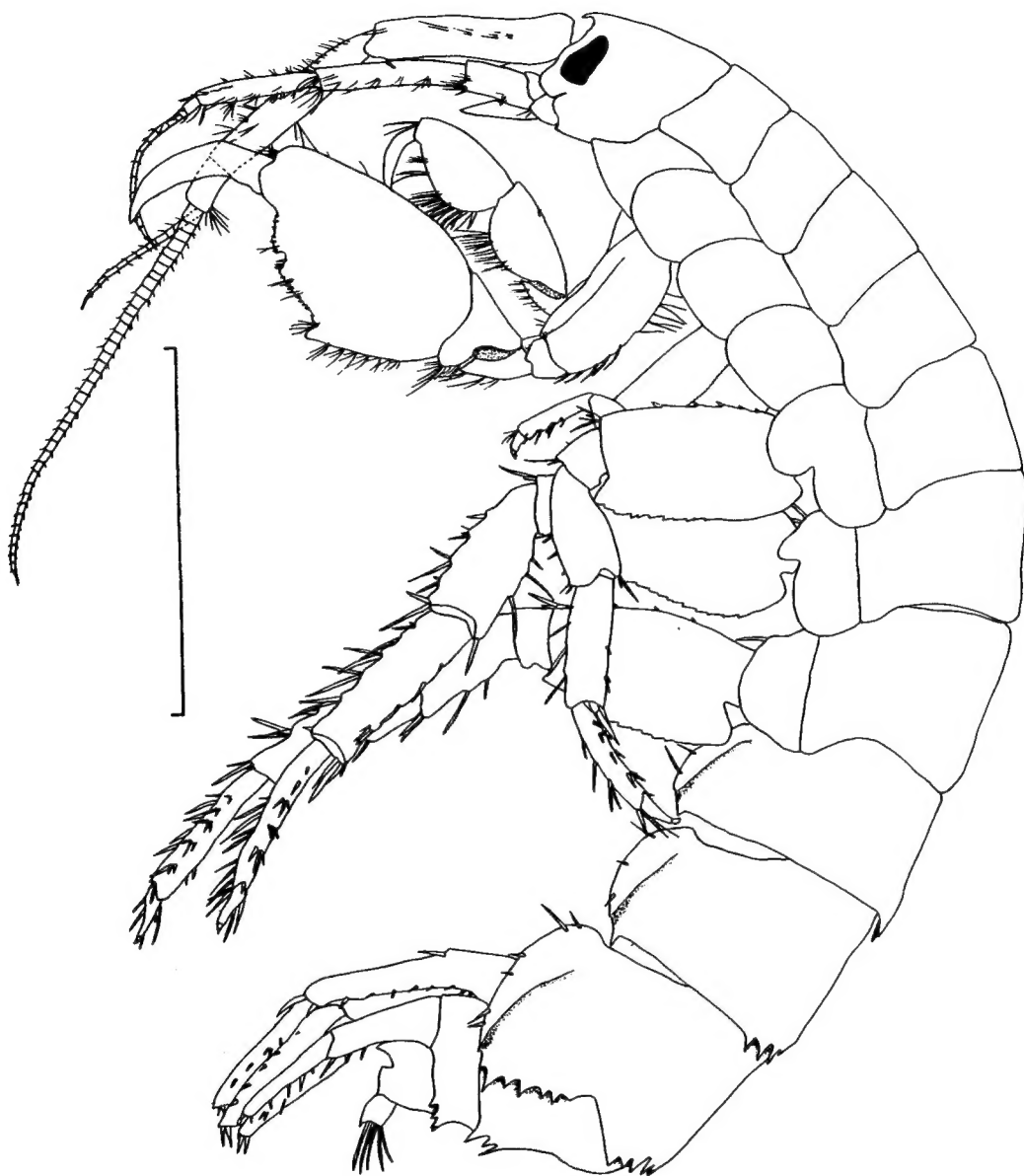


Fig. 1. *Ceradocus* (*Denticeradocus*) *koreanus*, new species, holotype male, body length: 21.3 mm. Bar = 5mm. (uropod 3 is not shown here).

First half of lateral cephalic lobe concave, second half convex and sub-quadrate in outline; slit of lateral cephalic lobe deep; anteroventral corner below slit with small sharp tooth. Eye large, oval, and dilated below.

Antenna 1 (Figs. 1;3C) longer than head and pereonites 1-6 combined; article 1 of peduncle produced on distal part ventrally, and armed with 1 spine and 2 setules on ventrodistal part and 4 spines on ventral margin; article 2 as long as article 1; article 3 about 23% as long as article 2; flagellum slightly shorter than peduncle, composed of 39 articles; accessory flagellum composed of 12 articles. Antenna 2 (Figs. 1;3C) shorter than antenna 1; peduncle of antenna 2 about 86% as long as peduncle of antenna 1; gland

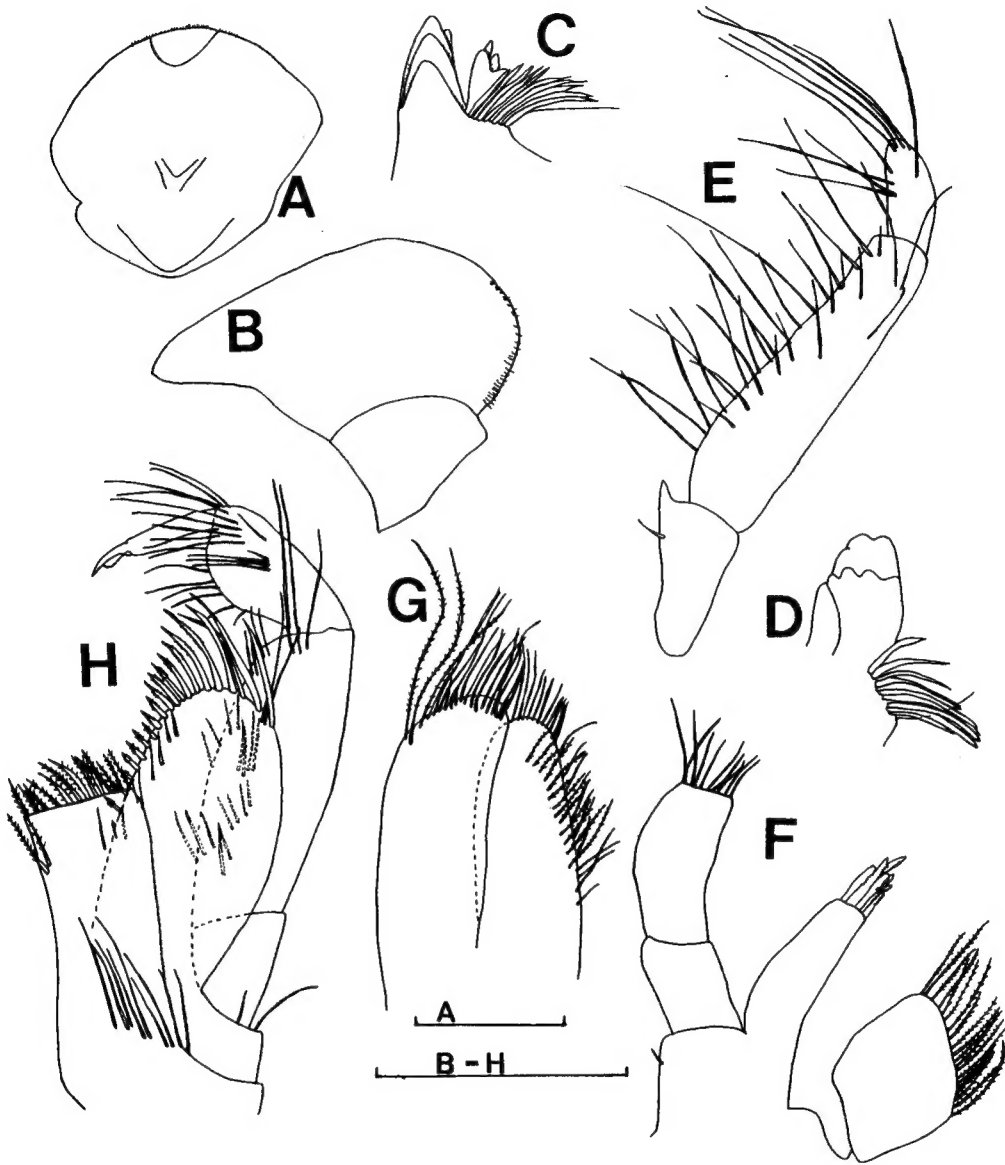


Fig. 2. *Ceradocus* (*Denticeradocus*) *koreanus*, new species, holotype male.

A, upper lip; B, lower lip; C, distal part of right mandible; D, distal part of left mandible; E, mandibular palp; F, left maxilla 1; G, plates of left maxilla 2; H, right maxilliped. Bars = 0.5 mm.

cone (Fig. 3D) slender, almost reaching to apex of article 3; ventrodistal part of article 3 produced as sharp tooth; article 5 about 86% as long as article 4; flagellum longer than article 5, composed of 15 articles.

Mouth part with oval upper lip (Fig. 2A). Mandible (Fig. 2C, D, E) with incisor bearing 4 teeth; lacinia mobilis armed with 4 teeth; spine row with 10 spines. Mandibular palp triarticulate; article 1 produced acutely on inner edge distally; article 2 about 2.3 times as long as article 1, marginally and submarginally setaceous on ventral side; article 3 about 74% as long as article 1, covered with long setae on distal part. Inner lobe of lower lip (Fig. 2B) well developed; mandibular process weakly developed. Maxilla 1 (Fig. 2F) with inner

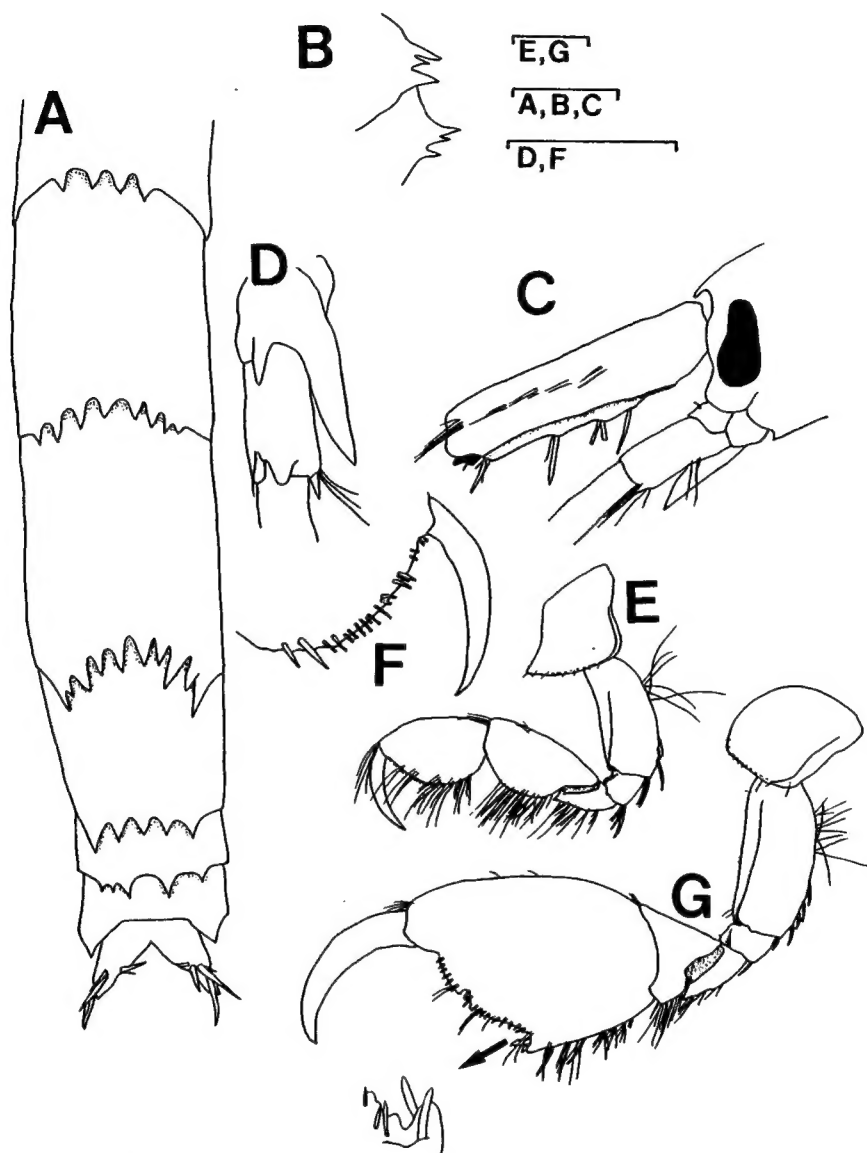


Fig. 3. *Ceradocus (Denticeradocus) koreanus*, new species, holotype male.

A, dorsal view of pleonites; B, dorsal teeth of pleonites 4,5; C, anterior part of head and proximal part of antennae 1,2; D, ventral view of gland cone of antenna 2; E, left gnathopod 1; F, anterodistal part of palm and dactyl of left gnathopod. 1; G, left gnathopod 2. Bars = 1 mm.

plate triangular in shape, bearing 20 plumose setae on inner margin; outer plate armed with 7 serrate spines on apex; palp biarticulate, article 1 about 62% as long as article 2 which covered with 10 setae on apex. Plates of maxilla 2 (Fig. 2G) subequal in size; inner plate not truncate, inner edge and apex of inner plate covered with 21 normal setae, facial setae row composed of 13 plumose setae; outer plate with 16 normal setae and 3 long plumose setae on apex only. Inner plate of maxilliped (Fig. 2H) with truncated apex; apex covered with 13 plumose setae; outer plate not reaching to distal end of article 2 of palp, armed on inner

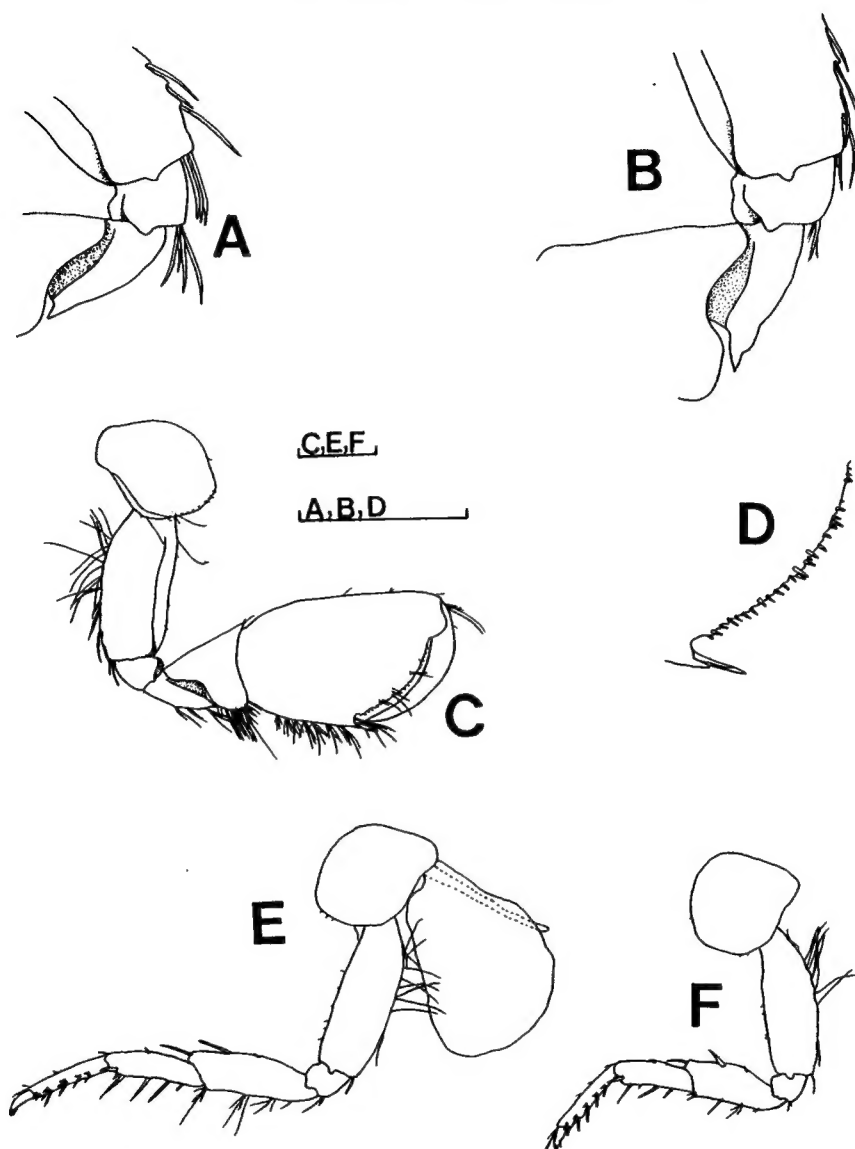


Fig. 4. *Ceradocus* (*Denticeradocus*) *koreanus*, new species, holotype male.

A, posterior parts of articles 2,3,4 on left gnathopod 1; B, posterior parts of articles 2,3,4 on left gnathopod 2; C, right gnathopod 2; D, palm of right gnathopod 2; E, left pereopod 1; F, left pereopod 2. Bars = 1 mm.

and inner-apical margins with 17 serrate spines which gradually grow longer and armed with 3 long and simple apical spines; palp 4-articulate, article 2 setaceous on inner margin; dactyl shorter than article 3, nail of dactyl about 35% as long as dactyl.

Gnathopod 1 (Figs. 3E, F; 4A) smaller than gnathopod 2. Coxa produced anteroventrally, lateral ridge terminated at seta on distal margin posteriorly. Article 2 with long setae and 3 slender spines along posterior margin and 3 slender spines on posterior margin distally. Distal margins of articles 2, 3 with protuberances. Lateral ridges of articles 2-4 normal. Article 4 with simple, sharp tooth on posterior margin distally. Articles 5 and 6 subequal in length, article 6 slightly expanded at middle, continuously rounded posteriorly. Palm

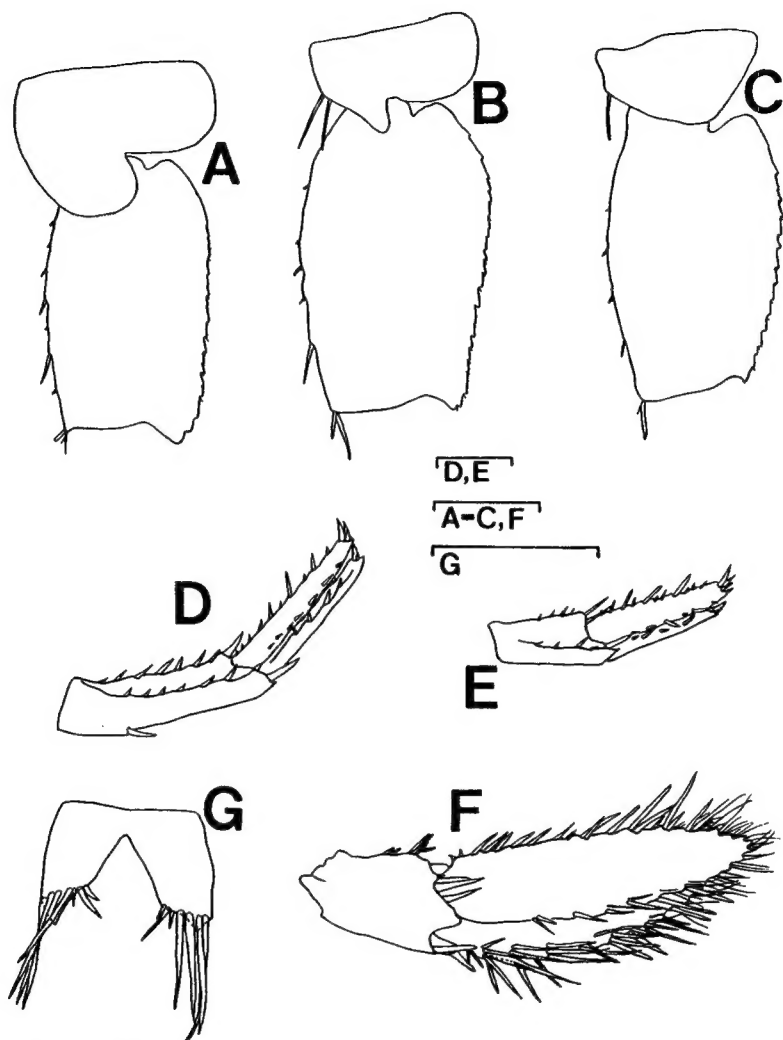


Fig. 5. *Ceradocus* (*Denticeradocus*) *koreanus*, new species, holotype male.

A,B,C, coxae and article 2 of left pereopods 3,4,5 respectively; D, left uropod 1; E, left uropod 2; F, left uropod 3; G, telson. Bars = 1 mm.

oblique, convex, not sharply defined, though defined by 2 strong spines and about 18 bifid spinules on submargin. Dactyl long, curved, and overlapping palm.

Left gnathopod 2 (Fig. 3G) larger than right gnathopod 2. Coxa square, lateral ridge terminated at seta on distal margin posteriorly. Article 2 of both gnathopod 2 with long setae and 4 slender spines along posterior margin and 2 slender spines on posterior margin distally. In both gnathopod 2 (Figs. 3G; 4B, C) distal margins of articles 2, 3 with protuberances at middle; lateral ridges of articles 2-4 normal; article 4 with simple, sharp tooth in posterior margin distally. Article 6 of left gnathopod 2 large, dilatant toward distal part; posterior margin and palm subequal in length, posterior submargin of inner part with 8 bundles of setae; palm convex, oblique, defined by strong, blunt tooth, and concave on middle part, with row of spines on each inner and outer submarginal part; row of spines of inner submarginal part composed of longer spines, with 2

strong spines by defining tooth; dactyl long, curved, fitting palm. Article 6 of right gnathopod 2 (Fig. 4C, D) slightly dilatant toward distal part, posterior margin and palm subequal in length, posterior submargin of inner margin with 8 bundles of setae; palm convex, oblique, defined by triangular tooth, and without concave part at middle, with row of spines on each inner and outer submarginal part; row of spines of inner submarginal part composed of longer spines, with 2 strong spines by defining tooth; dactyl long, curved, fitting palm.

Pereopod 1 (Fig. 4E) slightly larger than pereopod 2 (Fig. 4F); distal margins of article 2, 3 with protuberances at middle; anterior margin of article 4 with 3 spines; posterior margin of article 5 with 4 to 5 spines and distal submargin with 1 spine; article 6 provided with 5 bundles of spines composed of 2-3 spines posteriorly; dactyl normal. Article 2 through 6 and dactyl of pereopod 2 similar to those of pereopod 1.

Pereopods 3-5 (Figs. 1; 5A-C) successively slightly longer. Coxae subequal. Anterior margins of coxae 6, 7 provided with 2, 1 spines respectively. In pereopods 3-5, posterior margin of article 2 serrate and anterior margin provided with spines. Posterodistal corner of article 2 in pereopod 3 with blunt projection, sharp in pereopod 5. Article 5, 6 subequal in length in pereopods 3-5. Dactyls in pereopods 3-5 normal.

Uropod 1 (Figs. 1; 5D) passing slightly beyond distal end of uropod 2 and reaching to distal end of peduncle of uropod 3; outer ramus slightly shorter than inner ramus; peduncle 1.5 times as long as outer ramus, with 1 stout spine at 1/3 of outer lateral part from base and with 1 stout spine at outer distal end. Outer ramus of uropod 2 (Fig. 5E) slightly shorter than inner ramus; peduncle as long as outer ramus. Peduncle of uropod 3 (Fig. 5F) about 50% as long as inner ramus; inner ramus slightly longer than outer ramus; rami broad, covered with setae and spines along margins, with 3 teeth apically.

Telson (Fig. 5G) with weakly attenuate apices, each lobe with 7 spines, of which 4 spines elongate, apex of each lobe reaching to 28% of longest spine in length.

Pleonites 1-3 (Figs. 1; 3A) serrate evenly dorsally. Posteroventral corner of pleonal epimeron 1 armed with 1 tooth, posteroventral margin with 1 small tooth and 2 spines on ventral submargin, with lateral ridge ascending from posteroventral tooth. Posteroventral corner of pleonal epimeron 2 armed with prominent tooth, posteroventral margin with 1 small tooth and 3 spines on ventral submargin, with lateral ridge ascending from posteroventral tooth. Pleonal epimeron 3 prominently directing backward, distinctly serrate along posterior margin, posteroventral margin with 2 medium teeth and 6 spines on ventral submargin and margin, with lateral ridge ascending from lower posteroventral tooth. Pleonite 4 (Figs. 1; 3A, B) with 5 dorsal teeth, of which middle tooth somewhat enlarged. Pleonite 5 (Figs. 1; 3A, B) with 5 dorsal teeth, of which 3 teeth on left side and 2 teeth on right side, with middle gap between lateral teeth.

**Variations:** All materials examined exhibited asymmetry of gnathopod 2. Two paratype specimens have the left larger gnathopod 2 and one paratype specimen has the right larger gnathopod 2. Two types of dorsal tooth formula on the pleonite 5 are observed. Type 1 comprises one paratype specimen which has 5 teeth (3 teeth on the left side and 2 teeth on the right side) as holotype specimen. Type 2 comprises two paratype specimens which have 4 teeth (even tooth formula: 2 teeth on the left side and 2 teeth on the right side).

**Remarks:** According to Sheard (1939)'s key to subgenera of genus *Ceradocus*, this new species is assigned to subgenus *Denticeradocus* in "pleon segments postero-dorsally multidentate". Of the species in the subgenus *Denticeradocus*, the present species agrees with 2 species in having an oblique palm, defined by a tooth on the larger male gnathopod 2. The present species is most closely related to *Ceradocus* (*Denticeradocus*) *mahafalensis* Ledoyer, 1979, reported from Madagascar. But, the present species is readily distinguished

from *C. (D.) mahafalensis* by the following characteristics: (1) The palm of larger male gnathopod 2 of the present species is much broader than that of *C. (D.) mahafalensis*. (2) The palm of larger male gnathopod 2 of the present species has only one concave part, while in *C. (D.) mahafalensis*, the palm has two concave parts. (3) The projections on the posterodistal corner of article 2 on the pereopods 3-5 of *C. (D.) mahafalensis* are sharper than those of the present species. (4) Each telson lobe of the present species is armed with 7 spines, while in *C. (D.) mahafalensis* the lobe is armed with 4 spines. (5) The nail of maxillipedal palp of the present species is shorter than that of *C. (D.) mahafalensis*. *Ceradocus (Denticeradocus) spiniferus* Ledoyer, 1973, reported from Madagascar, differs from the present species in the dorsal tooth formula of pleonites 4, 5, the palmar shape of larger male gnathopod 2 (one quadrate hump on the connection part with dactyl), the longer nail of maxillipedal palp, and the more acute projection on the posterodistal corner of article 2 of pereopod 5.

Of the species in this subgenus, this new species agrees with 3 species in the tooth formulae on pleonites 1-3 and pleonal epimera 1-3. The present species differs from *Ceradocus (Denticeradocus) serratus* Bate, 1862 and *Ceradocus (Denticeradocus) oxyodus* Berents, 1983 in the longer gland cone of antenna 2, the palmar shape of larger male gnathopod 2 (in the present species, palm has one concave part and is defined by 1 tooth. But, in *C. (D.) serratus* and *C. (D.) oxyodus*, the palm has no distinct defining tooth and no concave part respectively), the more spines on each telson lobe, and the dorsal tooth formula on pleonites 4, 5. *Ceradocus (Denticeradocus) yandala* Berents, 1983, reported from Australia, is distinguished from the present species by the following characteristics: In *C. (D.) yandala* the middle concave part on palm of the larger male gnathopod 2 is deeper than that of the present species and palm of larger male gnathopod 2 shorter than that of the present species and the gland cone of antenna 2 is shorter than that of the present species, and each telson lobe is armed with fewer spines than the present species.

This new species resembles *Ceradocus (Denticeradocus) crenatipalma* Ledoyer, 1979 in the length of gland cone of antenna 2, and the length of palm of larger male gnathopod 2. But, this new species differs from *C. (D.) crenatipalma* in the dorsal tooth formula of pleonite 4, the longer apices of telson, the palmar shape of larger male gnathopod 2 (in this new species, the palm of larger male gnathopod 2 has only one concave part, while in *C. (D.) crenatipalma*, the palm has 3 concave part), and the shorter nail of maxillipedal palp.

The present species resembles *Ceradocus (Denticeradocus) chevreuxi* Sheard, 1939 in the length of gland cone of antenna 2, the dorsal tooth formula of pleonites 1-5, and the palmar shape of larger male gnathopod 2. But, the present species differs from *C. (D.) chevreuxi* by the shorter apices of telson, the deeper middle concave part of transverse palm on larger male gnathopod 2, the shorter nail of maxillipedal palp, and the blunter, smaller projection on the posterodistal corner of article 2 of pereopod 5.

*Ceradocus (Denticeradocus) inermis* Hirayama, 1986, reported from Japan, has similar geographical distribution to that of this new species. But, the present species is readily distinguished from *C. (D.) inermis* by the following characteristics: (1) The gland cone of antenna 2 of the present species is longer than that of *C. (D.) inermis*. (2) The palm of larger male gnathopod 2 is defined by a strong tooth, while in *C. (D.) inermis*, the palm is not defined by tooth. (3) Uropod 3 of the present species has more spines than that of *C. (D.) inermis*. (4) The apices of telson of the present species are shorter than those of *C. (D.) inermis*. (5) The tooth formulae of pleonites 1-5 and pleonal epimera 1-3 of the present species and *C. (D.) inermis* are different.

**Etymology:** The specific name is from the Republic of Korea, to which the type locality of the present species belongs.



## ABSTRACT

*Ceradocus (Denticeradocus) koreanus*, new species from the Mip'o, Korea is described and illustrated.

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